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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,989	01/30/2004	Toshikuni Shinohara	RHM-US020574	1988

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EXAMINER

HOANG, TU BA

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/707,989

Applicant(s)

SHINOHARA, TOSHIKUNI

Examiner

Tu Ba Hoang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-24 is/are allowed.
- 6) ☒ Claim(s) 25-37,39 and 46-50 is/are rejected.
- 7) ☒ Claim(s) 38 and 40-45 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>03/08/04</u> . | 6) <input type="checkbox"/> Other: ____. |

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Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because the form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. . Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities: on page 44, in paragraph [0237], there is no descriptions for " ΩnT " and " λ_{308} " in the equation 30. What are they? Is the number "308" intended for the particular processing chamber 308 shown in Figure 17 (i.e., the wave length of the microwaves in the resonator 308 as set forth in the latter paragraph [0372])? Similar corrections are suggested for paragraph [0372] in light of the equation 36 (paragraph [0371]) noting the term λ_{308} (i.e, it should be λ_{825} instead). On page 62, in paragraph [0331], the term " λ_{r15} " must be changed to " ϵ_{r15} " because only " ϵ_{r15} " was included in the equation 34 in paragraph [0030] on page 61. There is also no description for " L_Y " appeared in the equation 54 in paragraph [0491]. Furthermore, the entire paragraph [0519] on page 126 should be deleted since the incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

As for the same reasons previously set forth in the objection of the specification, Claims 46-50 are therefore rejected under 35 U.S.C. 112, first paragraph, specification, while being enabling for the claimed plasma processing apparatus as a whole, does not reasonably provide enablement for relationship between the length of the nozzle and the transmission of the microwaves defined in the recited equation noted in claim 46. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims in light of such equation.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 25-36 and 46-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 25, there is insufficient antecedent basis for "the **dielectric of the microwave** generating means" recited at lines 18-19 in the claim. It is unclear whether or not this "dielectric" the same as the dielectric recited at line 5.

Claim 46 is vague and indefinite for lacking the description of for " ΩnT " and " λ_{308} " in the equation defining the relationship between the nozzle length the transmission of the microwaves (recited at line 14). Clarification and proper definition for these terms are needed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 25 is rejected under 35 U.S.C. 102(b) as being anticipated by Koshimizu (US 6,101,970). Koshimizu shows a plasma processing apparatus comprising microwave generating means 402 for generating microwaves, a dielectric wall 108 (shown in Figures 1 and 7) that is connected to the microwave generating means, is formed into a plate-like shape (i.e., wall) that extends along a surface of the sample W to be processed (as clearly shown in Figure 7) for providing a uniform electric field distribution along a surface of the sample W, and processing means (138, 144, and 128) that processes the sample W using plasma generated in the reaction vessel 104 by the microwaves, wherein a plurality of introduction portions (418A, 418B, 418C) through which the microwaves are introduced from the microwave generating means 402 to the dielectric 108 are provided in an introduction surface 406 that is in contact with the dielectric (i.e., dielectric fields of the microwaves) of the microwave generating means 402, the central positions 408 of the introduction portions (418A, 418B, 418C) are arranged on a plurality of axes (416A, 416B, 416C) (shown in Figure 7) on the

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introduction surface 406 that extends in the same direction, and antinodes or nodes of the microwaves in the dielectric 108 are positioned at each position of the axes.

Claims 37 and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Samukawa et al (US 6,043,608). Samukawa et al shows a plasma processing apparatus comprising a microwave generating means 43, a slot plate 44 that is provided between the microwave generating means 43 and a reaction vessel 1 (shown in Figure 1) and in which a plurality of slots (as shown in Figures 2, 4, 9-11, such as slots 6) are formed, and that makes an electric field strength distribution of the microwaves generated from the microwave generating means 43 substantially uniform along the surface of the sample 20 to be processed, a first dielectric 5 (column 10, line 45, i.e., partition wall 5 is made of dielectric) that is provided between the slot plate 44 and the reaction vessel 1, and maintains or further enhances uniformity of the electric field strength distribution of the microwaves supplied from the slot plate 44, and processing means 3,12 that processes the sample 20 using plasma P generated in the reaction vessel 1 by the microwaves, wherein the thickness of the slot plate is 1mm or more (column 4, line 47, i.e., 1mm in thickness) and the cross-section can be 15mm (column 4, line 44, i.e., is 3mm or more).

Claims 1-18 and 19-24 are allowed.

Claims 38 and 40-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 26-36 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not show or fairly suggest the combination including the first and second dielectric elements and a slot plate recited in the manner noted in claims 1 and 38, the distance between the axes as recited in claims 26, 30, the length of the slots of the slot plate as recited in claim 40, and also the relationship between the length of the nozzle and the transmission of the microwaves in the manner recited in claim 46.


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Tsubaki et al (US 5,647,944), Suzuki et al (US 6,677,549), and Goto et al (US 2004/0071613).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu Ba Hoang whose telephone number is (571) 272-4780. The examiner can normally be reached on Mon-fri from 8:30AM to 6:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on (571) 272-4777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu Ba Hoang
Primary Examiner
Art Unit 3742

January 06, 2005